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Implications of Vietnam's Rice Export Limit for the Global and U.S. Rice Markets

Kayode Ajewole, Ethan Sabala, Jessie Lin, and Michael Johnson

Abstract

In 2023, the Vietnamese Government announced plans to reduce annual rice exports to 4 million metric tons by 2030—a 50-percent reduction from its 2024/25 export volume of 8 million metric tons. Since Vietnam is the world's second-largest rice exporter, surpassing Thailand in 2025 (USDA, FAS, 2026), this policy has the potential to increase volatility in global rice markets. A similar disruption occurred in July 2023 when India banned non-basmati white rice exports. After this ban, India's average monthly exports (from August 2023 through June 2024) fell 33 percent from the August 2022 to June 2023 average, contributing to higher international rice prices from July 2023 to September 2024. This study employs the Global Trade Analysis Project (GTAP) computable general equilibrium model to estimate the potential impacts of Vietnam's export restriction on global rice trade and the implications for U.S. rice exports. The results suggest that Vietnam's rice quota alone is unlikely to significantly affect U.S. production or exports. However, if other major rice exporters, such as India, enact export restrictions in response to rising prices, the United States could gain market share and experience larger export increases. Under such a scenario, U.S. rice exports and production increase by 13.5 and 3.9 percent, respectively.

Keywords: Vietnam, rice, trade, U.S. agricultural trade

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A report summary from the Economic Research Service

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Key Points

- In May 2023, Vietnam announced it would cut annual rice exports to 4 million metric tons by 2030, a 50-percent decrease from its 2024/25 export volume of 8 million metric tons (USDA, FAS, 2026).
- Vietnam is currently the second-largest rice exporter in the world behind India, surpassing Thailand in 2025. In the 2024/25 trade year, India, Vietnam, and Thailand had a combined 63.6 percent share of global rice exports, with individual shares of 37.5, 13.1, and 13.0 percent, respectively.
- This study has two scenarios. The first scenario analyzes the impacts of Vietnam reducing its 2030 rice exports to 4 million metric tons. The second scenario builds on the first scenario, with India responding to the increase in international rice prices from Vietnam's export restriction with its own rice export restriction.
- Results from the first scenario show rice import reductions for several countries. For example, the Philippines (Vietnam's largest rice export market) reduces total imports by 30.0 percent and the price of imported rice increases 10.5 percent.
- Under the second scenario, the impacts on global markets are more pronounced. Sub-Saharan African countries, for example, have larger reductions in imports and consumption because India has a larger presence in these markets than Vietnam.
- The results suggest that Vietnam's rice quota alone is unlikely to significantly affect the United States. However, U.S. exports and production increase by 13.5 and 3.9 percent under the second scenario, with the added restriction on Indian exports, as opposed to 1.1 and 0.4 percent under the first scenario.

Why Does This Matter?

One potential impact of Vietnam's export limit is an increase in rice exports by Vietnam's competitors. The impact of this export restriction for other major rice exporters will vary and depend on several factors including the level of direct competition between Vietnam and each exporter. The United States is currently the fifth-largest rice exporter in the world, but there is little direct competition between the United States and Vietnam for rice exports, so the impacts of Vietnam's

export limit on U.S. production and exports may be minimal. However, as the second-largest exporter in the world, Vietnam's export limit may result in an increase in the international price which, historically, has caused major exporters to limit exports to keep domestic prices low. These additional restrictions, modeled as a 33.0-percent reduction in India's rice exports, would lead to a larger increase in exports for the United States.

A Few More Details

This study analyzes the impacts of Vietnam's rice export limit on the global rice market. It uses the Global Trade Analysis Project (GTAP) computable general equilibrium model to determine the impacts of this policy. Population, Gross Domestic Product, labor, capital, and total factor productivity projections from the Centre for Prospective Studies and International Information (CEPII) were used to create a 2030 baseline in GTAP. This baseline was used to calculate Vietnam's 2030 rice exports and the corresponding shock that would result from restricting these exports to 4 million metric tons annually (51.77 percent). Introducing the export shock to the GTAP model using the updated 2030 baseline resulted in simulated impacts of Vietnam's export restriction on the global rice market. The study also examines an alternative scenario in which India introduces its own export restriction to shield domestic consumers from international price hikes, in response to global rice price increases resulting from Vietnam's export limit. The analysis uses India's 2022/23 rice export ban as a proxy for the hypothetical 33.0-percent export restriction of the second scenario. Note that the study utilizes the static GTAP model and that the results compare two equilibriums, one before the shock and one after. The time that it takes the market to adjust to the shock and reach the new equilibrium is not known. A limitation of the analysis is that, due to data limitations, the report does not disaggregate rice by variety, which may lead to some results representing an upper bound (i.e., the increase in U.S. exports may be an upper bound as U.S. rice is not a perfect substitute for Vietnamese rice), while other results represent a lower bound (i.e., impacts for importing countries may represent a lower bound as the substitution away from Vietnamese rice to other exporters is limited based on variety).

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Implications of Vietnam’s Rice Export Limit for the Global and U.S. Rice Markets

Introduction

Rice is the staple food for more than half of the global population, and about 90 percent of global rice is produced and consumed in Asia (Bandumula, 2018). Because of this, rice is the key staple food for consumers within major rice exporting countries in Asia, with the exception of Pakistan (USDA, Foreign Agricultural Service (FAS), 2026; USDA, Economic Research Service (ERS), 2026), so policies restricting exports to ensure domestic food security are common. Due to their large presence in the rice export market, restrictions on rice exports in major exporting countries such as India and Vietnam can negatively affect international rice markets, prices, and food security across the globe. This happened in 2008 when India, Vietnam, and 12 other countries introduced export restrictions to prevent domestic rice prices from spiking during the global food price crisis (Bradsher & Martin, 2008). Rice price spikes from 2008 to 2010 were large enough to prompt calls for the World Trade Organization (WTO) to discipline restrictive policies such as export taxes and bans (Sharma, 2011). At that time, in 2008/09,¹ India and Vietnam had a combined 27.66 percent share of global rice exports (USDA, FAS, 2026) and the smaller shares from alternative exporters—such as the United States and South American rice exporting countries (Brazil, Uruguay, Paraguay, and Argentina)—could not fill the shortfall in global rice markets. India and Vietnam have increased their presence in the global market and, in 2024/25, accounted for 50.63 percent of total rice exports, so the potential impacts of future rice export restrictions may be exacerbated by the increased concentration of the global rice market. In addition to overall market share, Vietnam has a wide breadth of export destinations, with 86 countries importing rice from Vietnam between 2020 and 2025 (Trade Data Monitor, 2026).

In May of 2023, Vietnam announced it would cut its annual rice exports to 4 million metric tons by 2030 as part of a broader policy (Hoang, 2023b). This cut is a 50.0-percent reduction from Vietnam’s 2024/25 exports of 8.0 million metric tons (USDA, FAS, 2026). The policy is intended, based on the prime minister’s official statement, to help boost exports of high-quality rice and assist in reducing Vietnamese agriculture’s impact on the environment (Prime Minister of the Socialist Republic of Vietnam, 2023). Another policy that was recently implemented in Vietnam is the Land Law 2024. This regulation, according to Lam (2024), “has made it easier for people to complete administrative procedures for changing land use purposes...” Consequently, Vietnamese farmers can more easily move away from rice production and toward the production of other crops, which will reduce Vietnam’s rice exports. Shrivastava et al. (2022) discussed this Land Law, as well as other policy reforms and actions that can be taken to reduce the impact of Vietnam’s rice production on the environment. That report found there are many market-based and regulatory instruments that are available, including trade restriction measures like the current rice export limit proposed for 2030.

Akter (2022) analyzed the effects of food export restrictions on the domestic economy of exporting countries and found that, though there may be temporary respite from price surges for domestic consumers, the short term welfare effect is minimal and, in some cases, negative. Moreover, the unin-

¹ Note that Vietnam’s market year is the January-December of the second year of the reported market year, which is the same as the trade year (January-December). For example, Vietnam’s 2023/24 market year is the same as its 2023/24 trade year (January-December of 2024). Moreover, market years vary by country, but trade years are consistent across countries. Consequently, this report cites trade data in trade years.

tended negative consequences for food producers outweigh these gains and the long term net welfare impacts are negative. Beckman et al. (2019) showed that limiting exports can potentially exacerbate global poverty, therefore extending the consequences of these policies beyond the domestic market.

A recent example of the potential impacts of export restrictions is India's rice export restrictions imposed in 2022 and 2023. Specifically, in September 2022, India implemented an export ban on broken rice and imposed a 20 percent export tax on other grades of rice (Singh & Beillard, 2022). Despite these restrictions, India's domestic rice prices rose more than 30 percent from October 2022 to July 2023 (Glauber et al., 2023). Consequently, India expanded its rice export ban to include all non-basmati white rice in July 2023. This restricted roughly 45 percent of its rice exports (Singh & Beillard, 2023a). Later, on August 25, 2023, India imposed a 20 percent export tax on parboiled non-basmati rice and 2 days later India implemented a \$1,200 per metric ton minimum export price on exports of basmati rice (Singh & Beillard, 2023b). Together, these policies restricted, to varying degrees, nearly all of India's rice exports. These restrictions were also exacerbated by restrictions related to the Russia-Ukraine war (Glauber et al., 2023). According to data from July 2024, India's average monthly exports (from August 2023 through June 2024) fell 33.0 percent from the August 2022 to June 2023 average (Trade Data Monitor, 2026).

In August 2023, following India's ban on exports of all non-basmati white rice, Vietnam experienced a 22-percent surge in its rice price from the previous month (Hoang, 2023a). Vietnam, and other exporters, increased their exports to make up for the relative shortage caused by India's bans, with September 2023–June 2024 monthly average exports for Thailand, Vietnam, Pakistan, and the United States increased by 28.6, 6.0, 34.8, and 46.7 percent, respectively, from their January 2022 to July 2023 averages (Trade Data Monitor, 2026). However, these other exporters (primarily Thailand and Vietnam) could not make up for the loss in global rice exports. The rice market differs from some other bulk agricultural commodity markets in that there are many different types, classes, and qualities of rice traded in the world, with little substitution among consumers and production limited to specific geographic areas. Despite long-term growth, rice remains a thinly traded commodity, with slightly more than 11 percent of the global rice crop currently entering the world market each year, up from about 6 percent in 2000 (USDA, FAS, 2026). This is in contrast with more than 26 percent for wheat and 15–16 percent for corn. Thus, while global rice markets can become volatile in a very short period, they can also adjust quickly as countries with excess supply fill any emerging gaps. However, the differentiation between rice varieties implies that any decline in exports of a particular variety of rice cannot be as quickly replaced by other exporters. For example, importers will not readily substitute long grain rice from the United States for aromatic Thai rice if Thailand suddenly reduces its exports. This reduces the efficacy of redirecting rice imports from Vietnam to other exporters to mitigate the impacts of shocks to the global market.

Despite the increases in exports from Thailand, Vietnam, Pakistan, and the United States, the average global monthly rice exports from September 2023 to June 2024 were 14.2 percent lower than the average from January 2022 to July 2023 (Trade Data Monitor, 2026). In the long run, it is possible for other rice producing nations to increase production and exports to make up for losses from some of the major exporters. For instance, Myanmar is currently producing and exporting rice below record levels and Cambodia's production continues to rise, thus indicating potential for export expansion by both countries. Moreover, following drastic increases in global rice prices in 2008, several rice importing countries (e.g., Senegal) boosted rice production to avoid dependency on the global market in the event of similar price increases in the future. However, land and resource limitations restrict the ability of countries to increase rice production and exports, so significant reductions in exports

from major exporters (e.g., India and Vietnam) would be difficult or impossible to replace. Therefore, Vietnam's rice export limit could lead to a shortage of exports globally, thus increasing the international price and reducing global consumption. One of the objectives of this study is to determine the extent to which other exporting countries can make up for the reduction in Vietnam's rice exports, thereby reducing the impacts on the international price and global consumption.

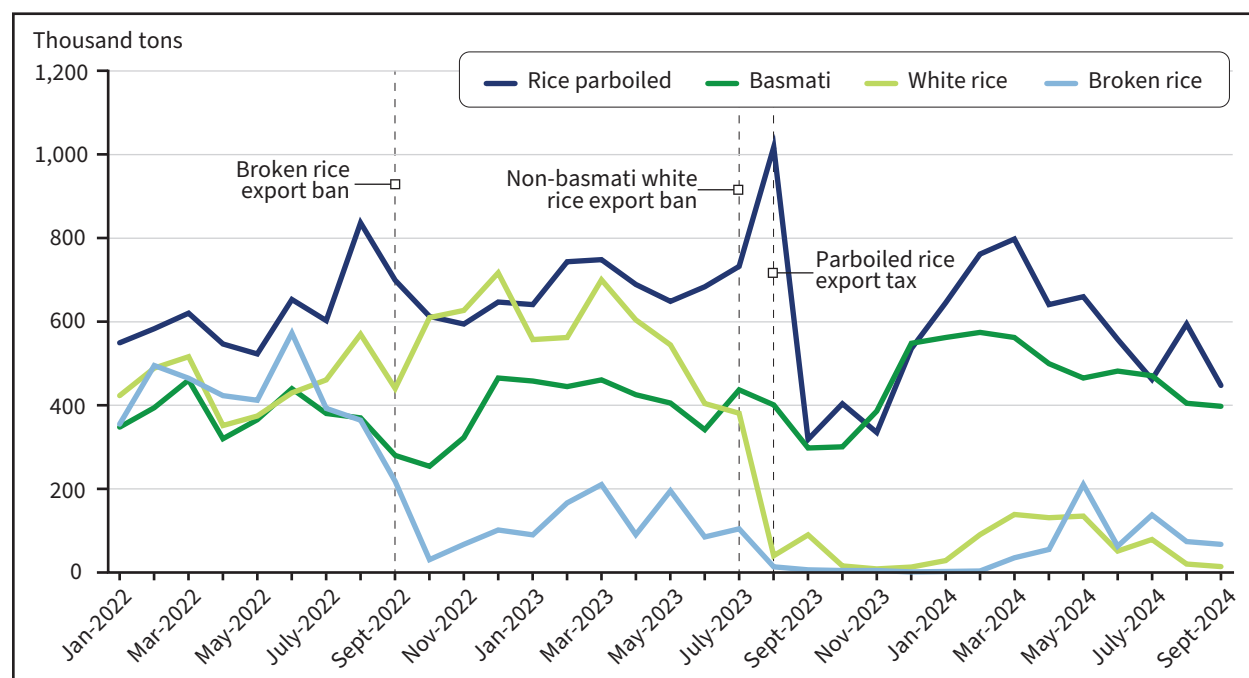
India implemented its 2022 and 2023 rice export restrictions to counter rising global food inflation that had transmitted to its domestic market, with the goal of maintaining domestic food security. As the global population rises, demand for food staples such as rice will also rise and, given limited resources to produce said food staples, could lead to future international price spikes and subsequent restrictive export policies. The USDA's baseline projections indicate that global rice imports will increase from 54.3 million metric tons in trade year 2023/24 to 65.6 million metric tons in trade year 2030/31, an increase of 20.8 percent (USDA, 2025). This increase in imports is largely driven by expected population and income growth in Sub-Saharan Africa, which includes several of the world's most food insecure nations. Furthermore, when Vietnam implements its rice export limit in 2030, restricting rice exports to 4 million metric tons per year, there will be lower quantities supplied in the face of a larger population with even greater demand. We would expect increased global rice prices, all else being equal, which could consequently lead to additional restrictive export policies in other major rice exporting countries (i.e., India).

The first objective of this study is to analyze the current structure and trends of the international rice market using the Global Trade Analysis Project (GTAP) computable general equilibrium (CGE) model to determine the potential impacts of Vietnam's export restriction on rice prices, production, consumption, and trade. The study then considers a second scenario in which India implements its own export restriction in response to international price increases caused by Vietnam's rice export restriction. Our results include the combined effects of the two policies on global rice prices, production, consumption, and trade. The results are then used to assess the potential for U.S. rice exporters to gain market share in the global rice market following the decline in exports from two of the largest exporters.

Realized Impacts of India's 2022 and 2023 Rice Export Restrictions

India's restrictions on rice exports provide a glimpse of the potential impacts of Vietnam's 4 million metric ton export limit. The immediate effect of India's export ban was a shift by global importers to the next largest suppliers of rice, Thailand and Vietnam (Hoang, 2023a), and a sharp rise in international rice prices. Figure 1 illustrates India's monthly rice exports by variety and shows that exports of broken and non-basmati white rice dropped considerably from July 2023 to August 2023 and remained at near zero values in the months following. Parboiled rice exports also fell almost 70 percent from July to August 2023, but parboiled rice exports rebounded in December 2023 as the international rice price increased to the point that the 20 percent export tax on parboiled rice was not restrictive. India's monthly basmati rice exports also increased in late 2023, motivated by the relative surplus of broken and non-basmati white rice in the domestic market lowering domestic prices and the relative shortage of rice in the international market increasing global prices.

Figure 1
India's monthly rice exports (January 2022–September 2024)

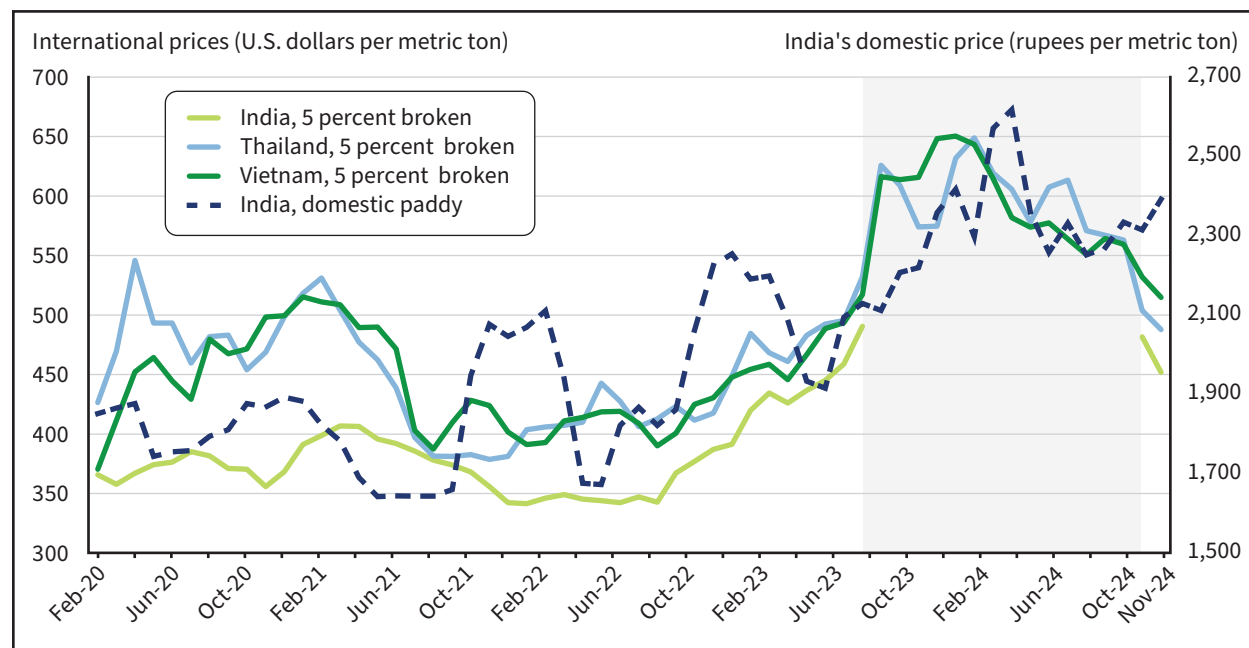


Source: USDA, Economic Research Service using data from Trade Data Monitor (2026).

The significant and sudden drop in India's rice exports in August 2023 caused a relative shortage of exports in the global market and raised international prices. Figure 2 shows that export prices for Thailand and Vietnam, the world's second- and third-largest rice exporters at the time, increased by more than 25 percent in August 2023 and remained elevated throughout India's ban on non-basmati white rice exports (shaded area in figure 2). Broken rice export prices did decline somewhat after the initial spike (10.04 and 9.24 percent for Thailand and Vietnam, respectively) as global markets shifted to account for the shock of India's rice export bans. However, prices remained higher than pre-ban levels until India removed its export ban in October 2024. Following India's export ban on non-Basmati white rice, the domestic rice price in India continued to rise and followed roughly the same path as Thailand and Vietnam export prices. The average wholesale paddy rice price in India was slightly below 2,130 Indian rupees per metric ton at the time the ban was introduced in July 2023. The domestic price of paddy rice in India peaked at more than 2,600 Indian rupees per metric ton in March 2024. The continued rise in the domestic price of rice in India after the export ban was introduced indicates the policy did not have the intended impact of suppressing domestic food price inflation. This corroborates the findings of Martin et al. (2024a). However, Martin et al. (2024b) found that systematic trade policy responses for rice and wheat reduced the transmission of world price shocks into the local market. This, in turn, limited the extent to which local producers and consumers adjust to these shocks, which exacerbated global price volatility.²

² There are several influential theories in international economics that leave little role for world prices as long-run determinants of trade policy (Grossman & Helpman, 1994; Bagwell & Staiger, 2002). If we accept these theoretical models, then other rice producing countries would not change the long-run setting of their tariffs in response to protection changes in Vietnam. While the long-run theoretical setting is stable under these models, in reality protectionist moves by major countries can trigger short-run political reactions or retaliatory trade actions, consistent with other empirical evidence (Giordani et al., 2016).

Figure 2

Rice export prices (January 2022–November 2024)

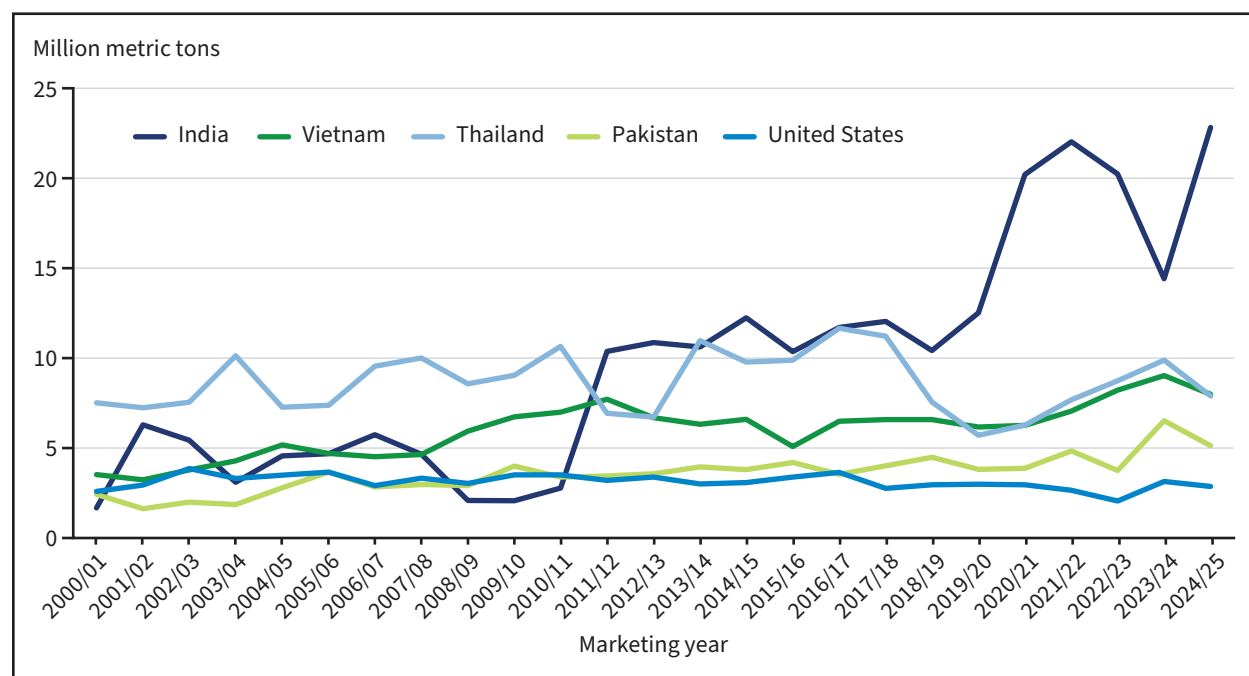
Note: The shaded area represents the duration of India's ban of all non-basmati white rice exports from July 2023 to October 2024. International prices are freight-on-board prices from the International Grains Council. India's domestic paddy rice price data were obtained from the Ministry of Agriculture, Directorate of Economics and Statistics.

Source: USDA, Economic Research Service using data from International Grains Council and India's Ministry of Agriculture, Directorate of Economics and Statistics.

Vietnam's Role in the Global Rice Market

With just under two-thirds of global rice exports in the 2024/25 trade year, India, Vietnam, and Thailand are the world's three largest rice exporters. Pakistan and the United States follow as the fourth- and fifth-largest exporters. Over the last 25 marketing years, Thailand's rice export volume has been somewhat volatile on a year-to-year basis, but its overall trend is flat (figure 3). Vietnam's rice export volume has been more stable, with moderate growth. India's export volume, however, has risen drastically, with its export volume increasing more than 13 times from 2000/01 to 2021/22. Over that same period, India saw its share of total rice exports rise from 7.01 percent to 38.10 percent, but that share fell to 25.41 percent by the 2023/24 trade year following India's ban on non-basmati rice exports. Note that India's exports rebounded in 2024/25 and India's share of the global market rose to 37.49 percent in that year. From 2000/01 to 2024/25, Thailand's share fell from 31.29 percent to 12.97 percent, and Vietnam's share fell slightly from 14.68 percent to 13.14 percent. The total volume of U.S. rice exports decreased from 2000/01 to 2024/25 (figure 3), but the U.S. export share fell considerably, from 10.78 percent to 4.72 percent. However, in addition to exporting different varieties of rice, the United States exports primarily to countries in the Western Hemisphere (i.e., North and South American countries). Meanwhile, India, Vietnam, and Thailand export primarily to countries in the Eastern Hemisphere (e.g., Asian and African countries). Consequently, the level of competition between U.S. rice and rice from India, Vietnam, and Thailand is relatively low, with some exceptions discussed in the "Importers: Who's Buying Rice From Whom?" section. Moreover, the fall in the U.S. share of total rice exports stems mostly from the fact that India's production has increasingly outpaced consumption, leading to a rice surplus to be exported.

Figure 3

Rice exports for major exporters, 2000/01–2024/25

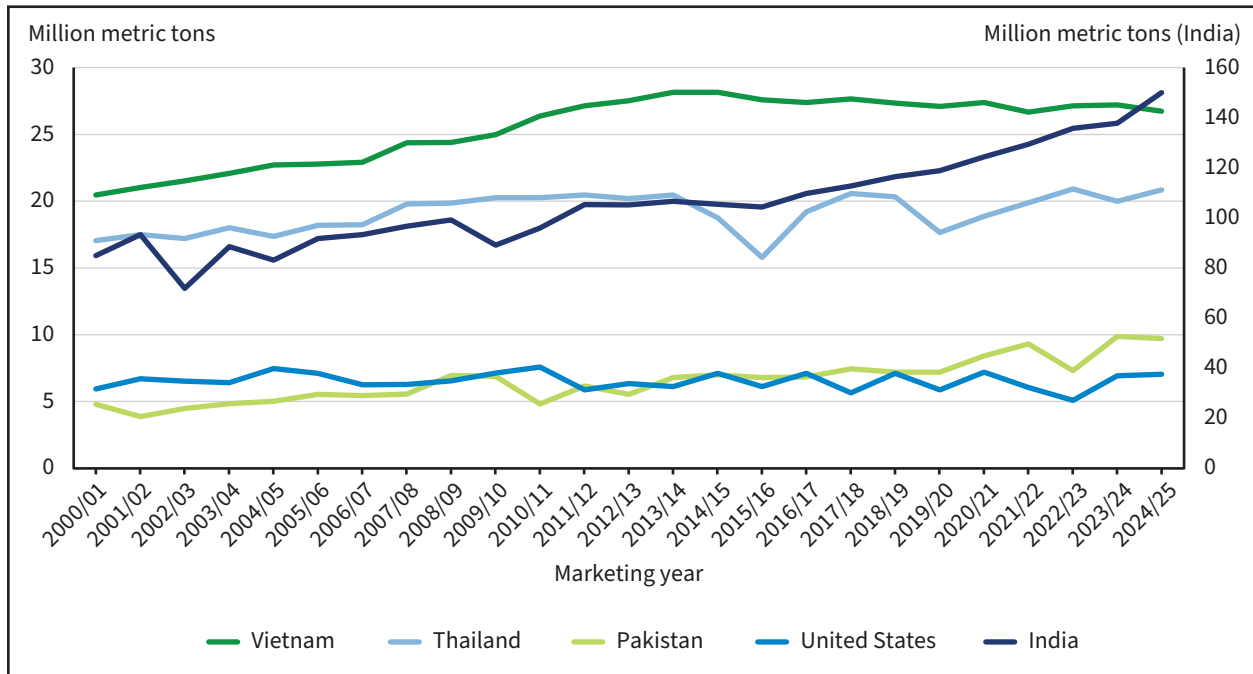
Source: USDA, Economic Research Service using data from the USDA, Foreign Agricultural Service Production, Supply, and Distribution database (2026).

Though the three largest global rice exporters are India, Vietnam, and Thailand, only India is among the top three global producers. The six largest global producers of rice in 2024/25 were India, China, Bangladesh, Indonesia, Vietnam, and Thailand. Domestic consumption in China, Bangladesh, and Indonesia is a larger proportion of production relative to India, Vietnam, and Thailand, which leads to lower exports for those countries. Therefore, though China, Bangladesh, and Indonesia were among the top four rice producing countries in 2024/25, they were not among the world's top four rice exporters³ (USDA, FAS, 2026). India, in addition to already having the largest production volume among the top five exporters in 2000/01, was also the fastest growing producer from 2000/01 to 2024/25 (figure 4). Vietnam is the second-largest producer of rice among the top five exporters and experienced strong growth from 2000/01 to 2014/15, but production has declined since the 2014/15 trade year due to contracting rice plantings. Vietnam's nominal rate of protection (NRP)⁴ for rice has been negative for most years since 2013 (figure 5), meaning Vietnam's farm gate price received by producers has been lower in recent years than the undistorted reference price at the farm gate level. This suggests that Vietnam's exports are restricted relative to the undistorted market expectation. Additionally, Vietnam's rice imports increased from 500,000 metric tons in 2020 to 2,750,000 metric tons in 2021 and have remained elevated since. These imports are primarily paddy rice imported from Cambodia, much of which is processed in Vietnam and reexported (Mit et al., 2025; Hoy, 2024). Thailand and Pakistan have had modest growth in production, while rice production in the United States has remained steady since the turn of the century.

³ China, Bangladesh, and Indonesia exported 1,725,000, 5,000, and 0 metric tons of rice, respectively, in the 2024/25 trade year (USDA, FAS, 2026). Note that Bangladesh generally exports aromatic rice to countries and regions with Bengali ethnic communities, including the United States, the European Union, and the Middle East (Ahmed, 2024).

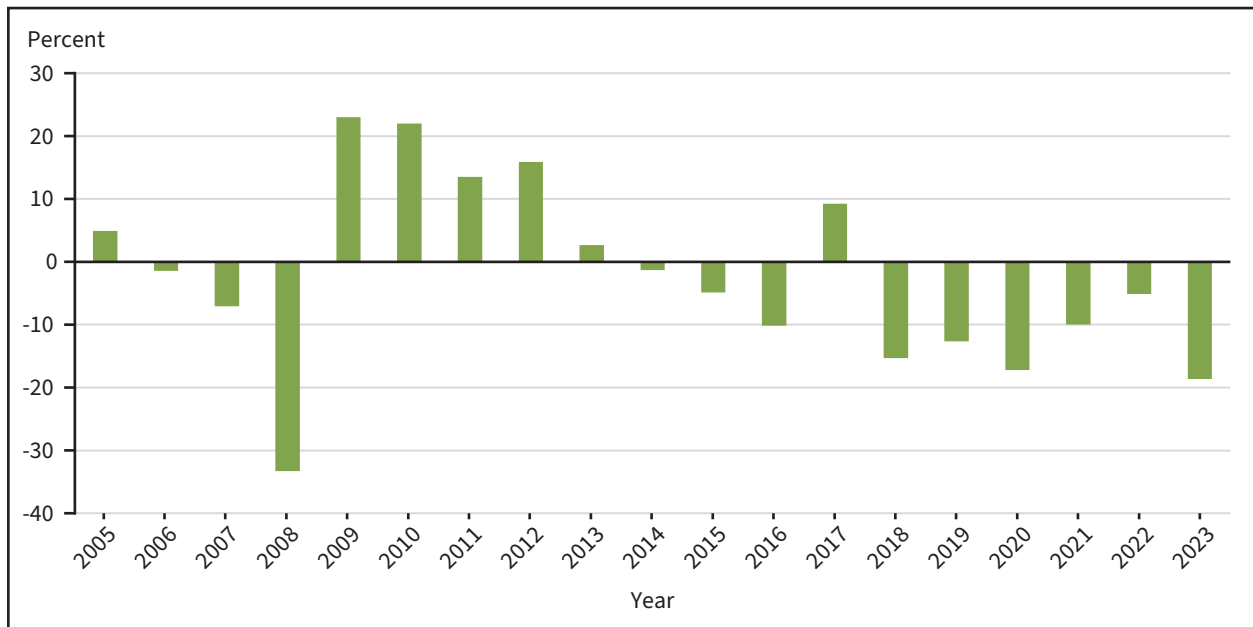
⁴ The nominal rate of protection (NRP) measures the extent to which a set of agricultural policies affects the market price of a commodity, relative to world prices. It is computed as the price difference, expressed as a percentage, between the farm gate price received by producers and an undistorted reference price at the farm gate level (Agincentives Consortium, 2024).

Figure 4
Rice production among major exporters, 2000/01–2024/25



Source: USDA, Economic Research Service using data from the USDA, Foreign Agricultural Service Production, Supply, and Distribution database (2026).

Figure 5
Vietnam's nominal rate of protection for rice, 2005–23



Source: USDA, Economic Research Service using data from the AgIncentives Consortium (2024).

Importers: Who's Buying Rice From Whom?

The international rice market differs from other bulk commodity markets in that not all rice is the same. For that reason, rice importers are partial to what rice they are importing and from which country they are importing. This influences the impacts of Vietnam's rice export restriction for global markets and, subsequently, for U.S. exporters. Vietnam produces and exports a wide variety of rice—including indica rice, aromatic (jasmine) rice, japonica rice, and other glutinous and specialty rice varieties. Conversely, the United States produces and exports rough (unmilled) rice, milled parboiled and brown rice, and fully milled (white) rice (USDA, ERS, 2023).⁵ Vietnam and the United States also differ in where they export rice.

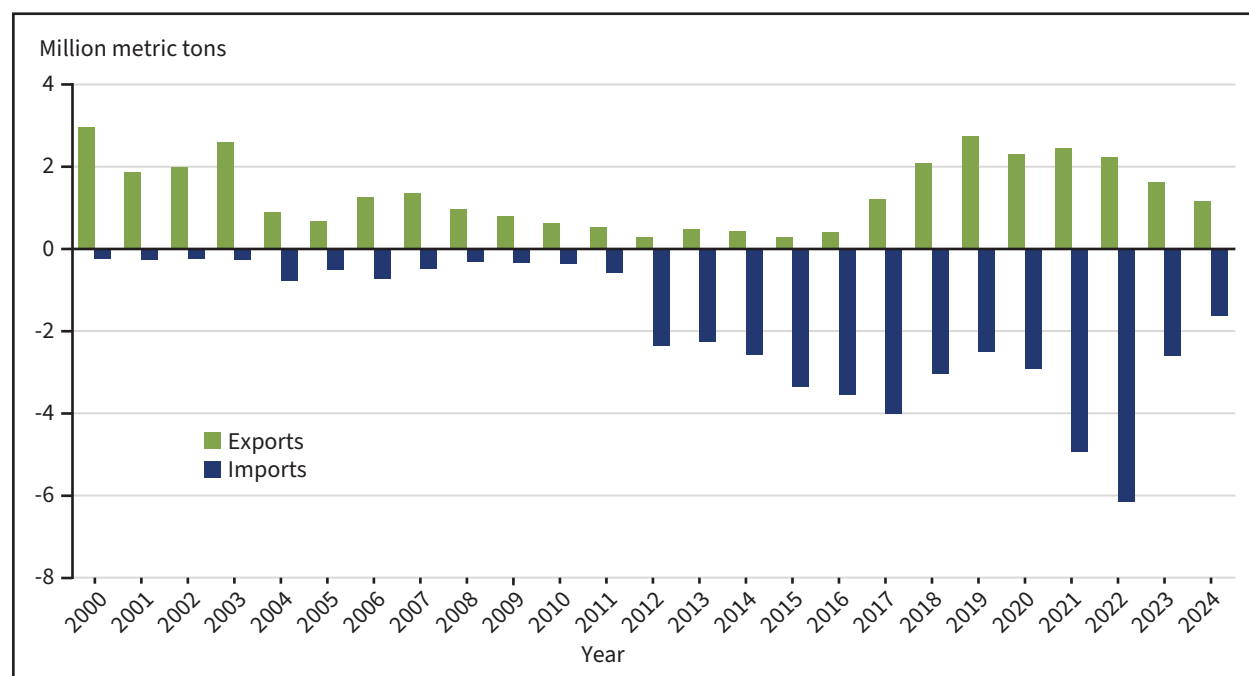
Major Export Markets for Vietnamese Rice

The largest importer of Vietnamese rice from 2019 to 2024 was the Philippines. The Philippines imported 3.55 million metric tons of Vietnamese rice in 2024, 48.10 percent of Vietnam's total rice exports in that year (Trade Data Monitor, 2026). This was up from 2.02 million metric tons in 2019, as the Philippines had rapid growth in rice imports from Vietnam over that period. The Philippines also surpassed China as the largest global rice importer in 2023; however, the Philippines' imports remain well below China's 2022 record imports. In addition to the Philippines, 3 other Southeast Asian countries (Malaysia, Indonesia, and Singapore) were among the top 10 importers of Vietnamese rice from 2019 to 2024. Indonesia's imports of Vietnamese rice are sporadic, ranging from 33,000 metric tons in 2019 to 1.25 million metric tons in 2024. Conversely, Vietnamese rice exports to Malaysia and Singapore were far more stable over the period. Combined, Southeast Asian countries imported 76.38 percent of Vietnam's total rice exports in 2024 (Trade Data Monitor, 2026).

China is one of the world's largest producers and importers of rice and was the second-largest importer of Vietnamese rice from 2019 to 2024, behind the Philippines. Historically, China has been both a major producer and exporter of rice. However, exports fell from the mid-2000s through the mid-2010s (figure 6). China's domestic rice consumption has also grown since 2011, to the point that China's average annual rice production is below its average annual consumption (USDA, ERS, 2023). Therefore, China has increasingly turned to rice imports to meet domestic demand. Figure 6 shows the evolution of China's international rice trade from 2000 to 2024. Starting in the early 2010s, China shifted from a net exporter to a net importer of rice. The largest deficit was observed in 2022, when China imported a record 6.2 million metric tons. Since then, imports have dropped considerably.

⁵ Note that data from Trade Data Monitor (2026) show that the United States also exports a small amount of broken rice.

Figure 6
China's rice trade balance, 2000–24



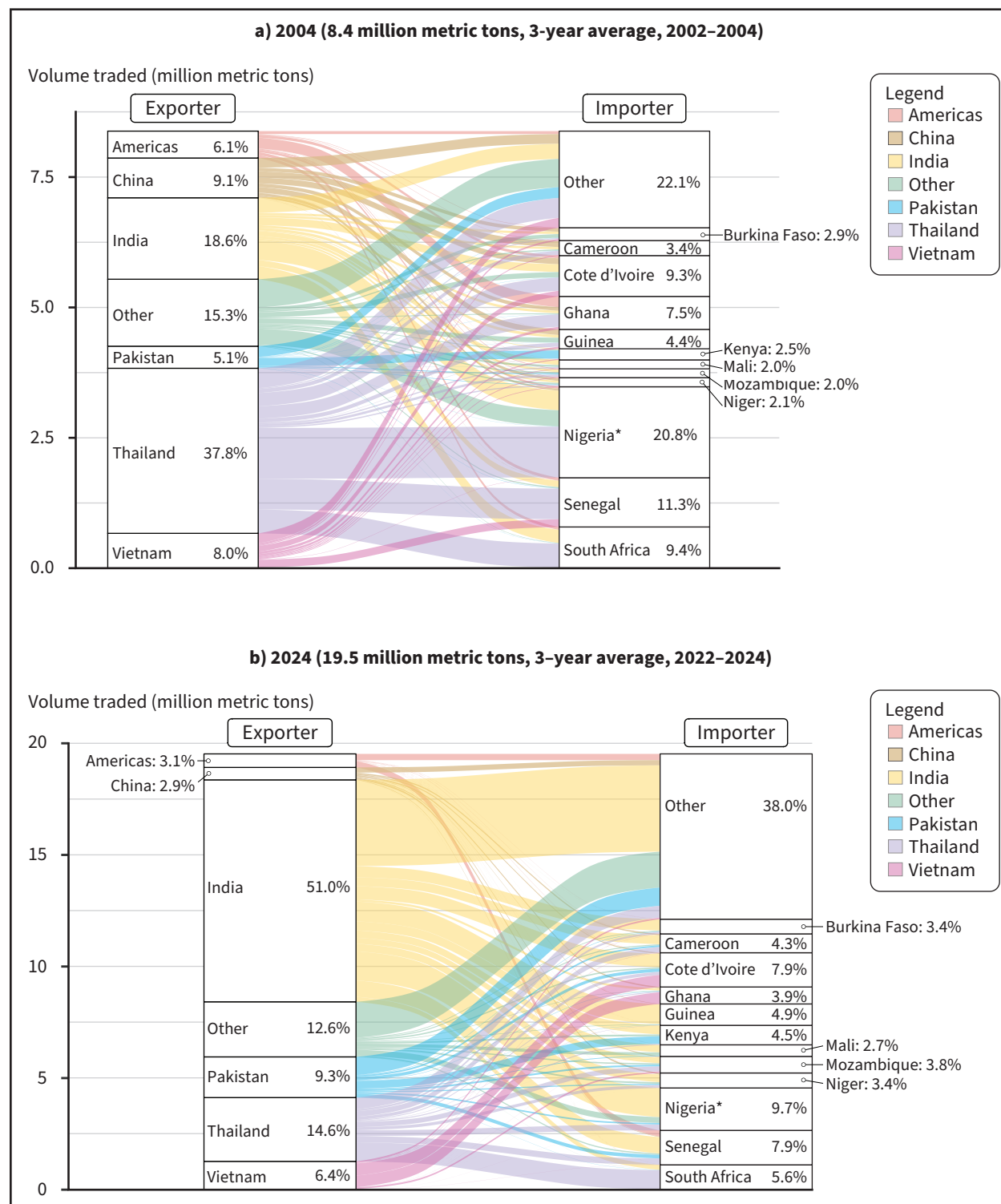
Source: USDA, Economic Research Service calculations based on data from Trade Data Monitor (2026).

At the end of 2021/22 season, China's grain stocks were estimated to be 323.4 million metric tons, more than half of the world total of 607.4 million metric tons (International Grains Council, 2024). China has been estimated to hold 60 percent of the world's rice reserve as of mid-2022, with only 18 percent of the world's population (USDA, ERS, 2023). In 2021, for the first time in nearly a quarter of a century, China purchased a significant amount of rice (more than 1 million metric tons) from India due to limited supplies from Thailand, Burma, and Vietnam and because of India's relatively competitive prices. India became China's largest supplier in 2021 and 2022 before India's export ban was implemented. Around 97 percent and 93 percent of rice imports from India to China consisted of broken rice in the years of 2021 and 2022, respectively (Trade Data Monitor, 2026). China's imports decreased from 6.2 million metric tons in 2022 to 2.6 million metric tons in 2023, the same year India implemented its ban on broken rice exports (Trade Data Monitor, 2026). China's rice imports from Vietnam fell off considerably in 2024. Consequently, Indonesia, Malaysia, Cote d'Ivoire, and Ghana surpassed China as the second-, third-, fourth-, and fifth-largest importers of Vietnamese rice in that year.

After substantial growth over the past two decades, the Sub-Saharan Africa region is currently the largest rice importing region in the world, accounting for about 30 percent of the total global rice imports (USDA, FAS, 2026). Figure 7⁶ shows that Sub-Saharan Africa's 3-year average rice imports from 2022 to 2024 (19.5 million metric tons) are a large increase (more than double) from their levels in the 2002–04 period when they totaled 8.4 million metric tons, on average. The region is also one of the largest importers of Vietnamese rice, with Cote d'Ivoire and Ghana being the fourth- and sixth-largest importers of Vietnamese rice from 2022 to 2024. As figure 7 shows, both countries imported the bulk of all Vietnamese rice destined for Sub-Saharan Africa between 2022 and 2024, on average.

⁶ The Base pour l'Analyse du Commerce International (BACI) or Database for International Trade Analysis uses the publicly available commodity trade database of the United Nations (COMTRADE) and reconciles any inconsistencies in import and export data reported by countries to the United Nations (Gaulier & Zignago, 2010). The result is a more coherent and complete database that allows for international comparison across countries when assessing global trade flows and volumes.

Figure 7

Volume and flow of the rice trade with Sub-Saharan Africa, 2002 and 2024

Americas = countries of North and South America.

Note: Percentages are the percent of total global exports and imports destined for Sub-Saharan Africa.

*Note that exports to Benin are included in exports to Nigeria, as the bulk of imports into Benin are reexported to Nigeria.

Source: USDA, Economic Research Service calculations using the Base pour l'Analyse du Commerce International (BACI) or Database for International Trade Analysis, 2026, Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

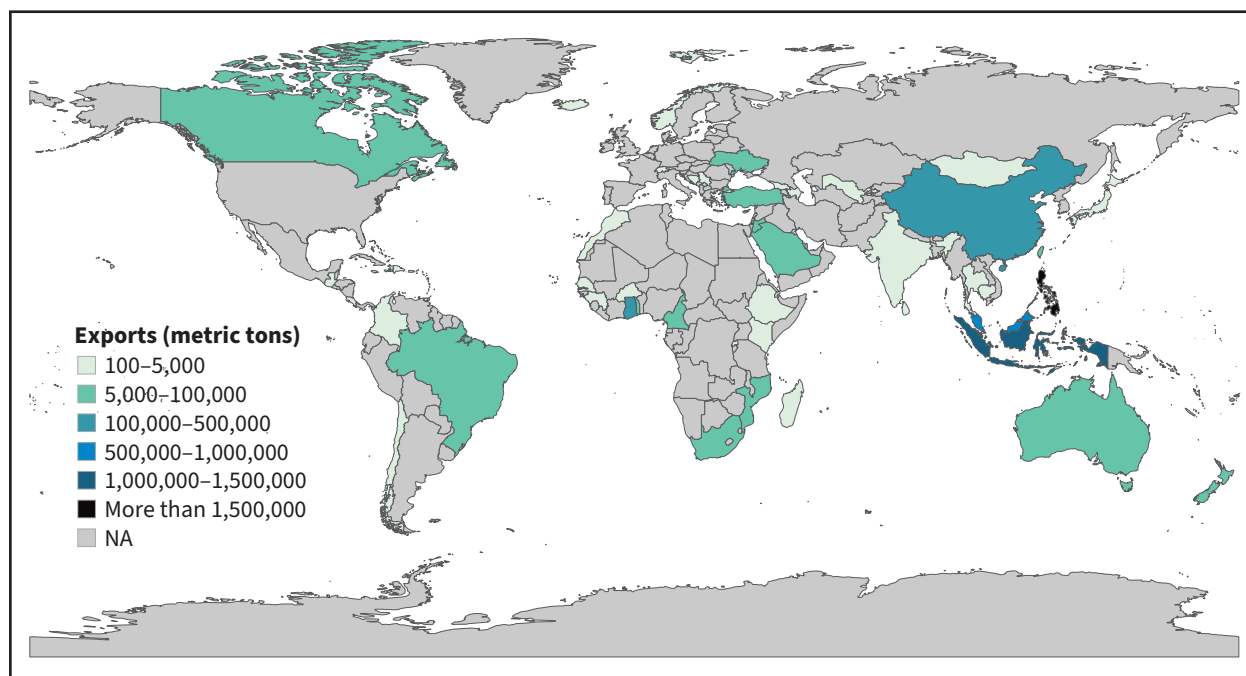
As figure 7 illustrates, rice imported from India has become the most important food source among most countries in Sub-Saharan Africa. Between 2022 and 2024, African countries in the Sub-Saharan Africa region imported an annual average of 19.5 million metric tons, with 51.0 percent of this sourced from India. In contrast, the share of Vietnamese rice imports was 6.4 percent. Thailand was the major source for imports during the earlier (2002–04) period. From 2022 to 2024, the top 12 importers accounted for 62.0 percent of all rice imports in Sub-Saharan Africa (figure 7). Nigeria, Cote d’Ivoire, and Senegal led this group as they accounted for more than 25 percent of all rice imports into the region in this most recent period.⁷ Other top importers for the 2022–2024 period include South Africa, Guinea, Kenya, and Cameroon.

South Korea, Hong Kong, and the European Union make up the remainder of the top 10 importers of Vietnamese rice from 2018 to 2023. Except for South Korea, Vietnam and the United States share no common markets among their top 10 rice export destinations, and the United States currently exports little rice to these markets. This is, in part, because the United States doesn’t compete in terms of price for similar rice varieties and doesn’t compete at all in specialty rice markets (e.g., basmati and jasmine rice). Overall, more than 90 percent of Vietnam’s rice exports are imported by countries in Asia and Africa, which house most of the world’s food insecure population. Mottaleb and Durand-Morat (2024) ascertained the interrelationships among rice prices in major rice exporting countries and found that Vietnam is the price leader in the non-aromatic long-grain market and Thailand is the leader in the aromatic market.⁸ The authors suggested that monitoring the trends in Vietnam, Argentina, Brazil, India, and Thailand would provide an early warning system to better prepare for supply shocks in the international market. Figure 8 provides a global map of Vietnam’s rice exports, with a majority of exports remaining in Asia and Sub-Saharan Africa. Vietnam primarily competes with India, Thailand, and Pakistan in these markets.

⁷ Note that Nigeria’s imports include imports into Benin, as the bulk of Benin’s rice imports are typically destined for the huge Nigerian market but are not officially recorded (Johnson & Dorosh, 2017).

⁸ Note that Thailand is the global leader for aromatic jasmine rice, but that India and Pakistan are the global leaders for aromatic basmati rice (Akmal et al., 2014).

Figure 8

Map of Vietnam's global rice exports, 2024

Note: Does not include exports of less than 100 metric tons.

Source: USDA, Economic Research Service calculations using data from Trade Data Monitor (2026).

Major Export Markets for U.S. Rice

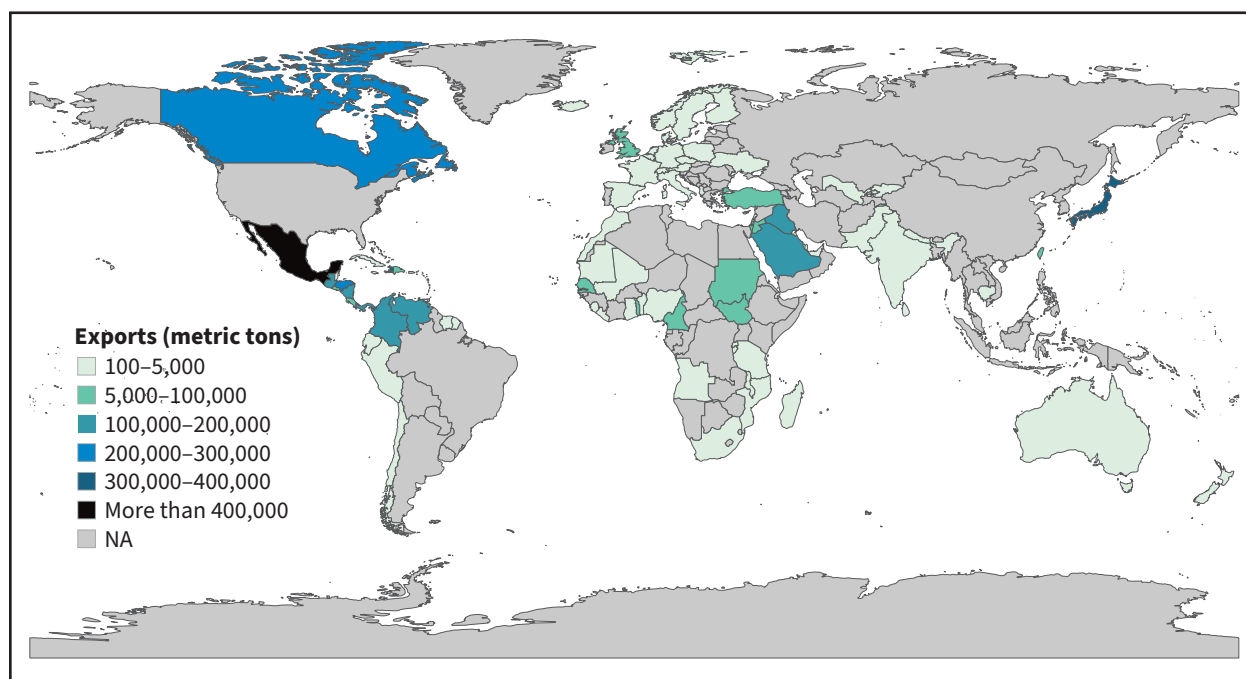
Vietnam's rice exports are relatively concentrated among a small number of countries. Ten countries imported 93.8 percent of Vietnam's total rice exports in 2023, whereas the top 10 export destinations for U.S. rice make up 79.7 percent of total U.S. exports. Most U.S. rice exports remain in the Western Hemisphere with Mexico, Haiti, Canada, Honduras, Colombia, Nicaragua, and Guatemala all among the top 10 export markets for U.S. rice. In fact, 57.22 percent of total U.S. rice exports in 2024 were imported by countries in the North and South American continents, including Central America and the Caribbean. Mexico has been the largest importer of U.S. rice for decades and, in 2024, imported 23.74 percent of U.S. rice exports.

Though the United States primarily exports rice to countries within the Western Hemisphere, there are exports into East Asia via Japan, South Korea, and Taiwan. Japan has very stringent import duties on foreign rice, but the United States has maintained a steady export quantity of rice to Japan since 2000. Japan enforces a tariff-rate quota (TRQ) on rice imports, under which the first 682,000 metric tons of rice (milled basis) are imported tariff free (Fujibayashi, 2025). The United States has consistently supplied just under half of this TRQ. The quantity of U.S. rice exports to South Korea followed an upward trend from 2000 to 2021 but fell in 2022 and 2023. Despite allocating a country-specific quota of 132,304 metric tons for the importation of U.S. rice beginning January 1, 2020 (Choi & McGuire, 2020), imports fell from 191,000 metric tons in 2020 to 43,000 metric tons in 2023. This decline was in concurrence with a significant drop in South Korea's overall rice imports, which fell from 526,000 metric tons in 2020 to 282,000 metric tons in 2023. Vietnam's rice exports, for example, to South Korea fell from 123,000 to 69,000 metric tons over the period. South Korea's imports rebounded in 2024, and the country imported 215,726 metric tons from the United States in that year. Similar to Japan, Taiwan has a rice (brown basis) TRQ of 144,720, or roughly 116,000 metric tons (milled basis). The United States typically supplies 50,000–65,000 metric tons of these imports annually (Lin, 2024). Virtually all the rice

the United States exports to Japan, South Korea, and Taiwan is medium- and short-grain rice (Trade Data Monitor, 2026) from California (USITC, 2025). Very little of this type of rice is grown in Vietnam and is exported only in small quantities.

Two countries in the Middle East—Saudi Arabia and Iraq—climbed into the top 10 importers of U.S. rice from 2018 to 2023. Saudi Arabia’s imports of U.S. rice have been stable, changing very little from 2000 to 2023. U.S. exports to Iraq, dissimilarly, range considerably year by year. For example, exports fell from 154,000 metric tons in 2019 to 0 metric tons in 2020, before soaring to 219,000 metric tons in 2023. Figure 9 shows a map of U.S. rice exports in 2023 and highlights the predominant role of countries in the North and South American continents, including Central America and the Caribbean.⁹

Figure 9
Map of U.S. global rice exports, 2024



Note: Does not include exports of less than 100 metric tons.

Source: USDA, Economic Research Service calculations using data from Trade Data Monitor (2026).

U.S. rice exports to several non-traditional markets increased following India’s ban on exports of all non-basmati white rice, as the United States diverted some exports to countries that traditionally import from India. For instance, U.S. monthly rice exports to Senegal—India’s fourth-largest rice export market from 2015 to 2024—averaged 162 metric tons in the 4 years leading up to India’s ban on non-basmati white rice exports (July 2019–June 2023). However, the monthly average increased to 8,757 metric tons in the months following India’s ban (July 2023–September 2024), a 5,316-percent increase (Trade Data Monitor, 2026). This increase was almost entirely due to Senegal’s purchase of 34,592 metric tons of broken rice from the United States in February 2024. Senegal has purchased large volumes of U.S. rice in the past (i.e., June 2017, April 2011, and November/December 2010 (Trade Data Monitor, 2026)), but this is rare and only occurs when there is a market distortion causing U.S. prices to be low relative to other major exporters. In fact, from 2000 to 2024, 59.1 percent of Senegal’s rice imports from the United States were imported in the 5 months listed above (Trade Data Monitor,

⁹ Note from the figure that Colombia and Venezuela are the predominant export destinations in South America. Further, note that much of the exports to Sub-Saharan Africa are in the form of food aid (USDA, ERS, 2025).

2026). Despite this, and increased exports to several other non-traditional markets, the majority of countries turned to Thailand and Vietnam to replace lost imports from India following the ban. This is because, as previously shown, the United States primarily exports rice in the Western Hemisphere and is uncompetitive in markets that import rice from India, Thailand, and Vietnam. For this reason, it is likely that Vietnam's proposed export limit will result in larger gains for India and Thailand as opposed to the United States.

Modeling and Results

This study uses the Global Trade Analysis Project (GTAP) computable general equilibrium model, which is a mathematical model that estimates changes in economic variables, like prices and output, resulting from changes in economic policies and consumer preferences (Hertel et al., 2007). In the model, producers are assumed to minimize cost in a perfectly competitive market using a fixed proportion Leontief production function. In this function, capital and labor are fully employed and mobile so that they can switch between sectors. Consumer demand is represented by a constant difference of elasticity system, where Armington elasticities determine the allocation of domestic and imported goods and the sources for imported goods. The first step in the modeling approach was to establish a baseline from which to compare the simulation results. To do this, we created a baseline scenario that includes projected changes in population, Gross Domestic Product (GDP), labor, capital, and total factor productivity from the base GTAP year to 2030.¹⁰ We gathered data for population, GDP, labor, capital, and total factor productivity projections to 2030 from the Centre for Prospective Studies and International Information (CEPII) EconMap database for the 138 regions included in the model (Fontagné et al., 2022).¹¹ Introducing the projected changes in these macroeconomic variables as shocks to the static GTAP model provides results that represent the baseline in 2030. Using this baseline, we can first determine the impacts of Vietnam's own rice export restrictions relative to the status quo by introducing a shock to Vietnam's rice exports that reduces exports to 4 million metric tons. We then analyze a second scenario in which India imposes export restrictions, similar to those imposed in 2022–2023, in addition to Vietnam's restriction to determine the combined impacts.¹²

Vietnam's rice exports in 2025 were 8 million metric tons (USDA, FAS, 2006). In the 2030 baseline scenario, Vietnam's rice exports increase 3.67 percent from 2025 levels to 8,293,600 metric tons.¹³ From this, we determine that Vietnam's 4 million metric ton rice export cap in 2030 is equivalent to a 51.77-percent drop from baseline exports. Therefore, beginning with the 2030 baseline, we impose a 51.77-percent drop in Vietnam's exports to assess the impacts of this policy on global prices, production, consumption, and trade. This type of shock simulates a rigid reduction in Vietnam's export volume, like an export quota, and does not simulate an export tax. This impacts the results of the model in that an export quota, unlike an export tax, does not generate tax revenues and leads to different price and welfare impacts. It is also important to note that the goal of reducing exports to

¹⁰ 2014 is the base year for the version of GTAP used in this study, but this was updated to 2025 to bring the model as close to the current market situation as possible and to increase the accuracy of the results.

¹¹ These regions and the projected changes gathered from CEPII are included in the appendix.

¹² A more thorough discussion of the GTAP modeling process is included in the appendix.

¹³ The USDA International Long-Term Projections include a 2030 Vietnam rice export volume of 6,689,000 metric tons (USDA, 2025). This is under the model's baseline trade volume of 8,293,600, but the model's volume is not abnormal, as Vietnam exported 9,035,000 metric tons in 2023/24 and 8,000,000 in 2024/25 (USDA, FAS, 2026).

4 million metric tons by 2030 is part of a broader policy that includes other proposed changes; for instance, increasing the added value of rice exports. However, the policy mechanisms by which this would be accomplished were not explicitly stated, so this model only includes the explicitly stated intention of reducing rice exports to 4 million metric tons per year by 2030. The model includes this as an immediate shock in the year 2030. Also, the static GTAP model used in this study compares two equilibriums, one before the shock and one after. The time that it takes the market to adjust to the shock and reach the new equilibrium is not known. Lastly, due to data limitations the model treats all rice the same and does not disaggregate by variety. Consequently, the results are likely an upper bound. The results for some of the world's largest rice importing and exporting countries, as well as major importers of Vietnamese and/or U.S. rice, are given in table 1. Some of the countries had small starting values (less than 100,000 metric tons) for demand, supply, imports, and/or exports (e.g., rice exports from the Philippines, which are designated with an asterisk). As a result, the relatively large percentage changes shown in the table correspond to small changes in quantity. Also, the results in tables 1 and 2 represent total changes (i.e., the percent changes in the "Imports" column represent the change in total imports not the change in imports from Vietnam).

Table 1

Impacts of Vietnam's 4 million metric ton rice export restriction on global rice markets

Country	Domestic price (percent)	Export price (percent)	Import price (percent)	Domestic consumption (percent)	Domestic production (percent)	Imports (percent)	Exports (percent)
China	0.02	0.01	4.77	0.00	0.11	-16.94	1.14
Cambodia	0.20	0.20	0.11	-0.01	0.33	0.32*	3.56
Indonesia	0.16	0.10	2.64	-0.03	0.18	-9.17	4.09*
Malaysia	1.16	0.76	2.75	-0.09	2.36	-4.95	0.56
Philippines	2.25	1.33	10.45	-0.30	2.85	-30.04	-19.53*
Thailand	0.35	0.35	0.16	-0.03	1.43	0.54	3.02
Vietnam	-4.12	13.23	0.07	0.59	-12.13	-22.57	-51.77
India	0.03	0.03	0.13	0.00	0.13	-0.47*	0.96
Pakistan	0.15	0.15	0.16	-0.02	0.47	0.15*	1.64
United States	0.06	0.01	0.44	0.00	0.35	-1.21	1.11
Mexico	0.08	0.01	0.23	0.00	0.17	-0.55	1.11*
Brazil	-0.01	-0.01	0.02	0.00	0.01	-0.07	0.85
Iran	0.03	0.00	0.04	0.00	0.06	-0.04	1.61*
Saudi Arabia	0.05	0.00	0.05	0.00	0.22*	-0.01	1.32*
Cote d'Ivoire	0.07	-0.03	1.92	-0.07	0.37	-1.01	0.69*
Ghana	4.70	1.00	6.49	-0.74	11.31	-7.29	-2.78*
Senegal	0.16	0.06	0.18	-0.03	0.22	-0.09	0.17*

*Starting value is small (<100,000 metric tons), so the given percent change corresponds to a small change in quantity.

Source: USDA, Economic Research Service using the Global Trade Analysis Project (GTAP) model.

Following its restriction on rice exports, Vietnam's domestic price (the price that consumers pay when purchasing rice) falls 4.12 percent, due to the surplus of domestically produced rice that now must be sold in the domestic market. The export rice price increases 13.23 percent as the availability of rice exports falls by 51.77 percent and the rice import price is left relatively unchanged, despite a 22.57-percent drop in imports. The domestic supply of rice in Vietnam falls 12.13 percent but, because of the increase in availability of domestically produced rice and subsequent drop in the domestic price, demand increases by 0.59 percent. The results suggest that the export restriction has little impact on the United States with its domestic rice price increasing only 0.06 percent, while rice exports increase by 1.11 percent and imports fall 1.21 percent. This finding highlights the point made earlier, that the United States and Vietnam have little direct competition with one another in the global rice market.

The relatively small rice price changes for many of the countries highlight the ability of global markets to react to shocks and reach a new equilibrium. Note, however, the domestic and import rice price impacts for Southeast Asia's major rice importing countries (e.g., Indonesia, Malaysia, and the Philippines) versus the major rice importing countries in the Middle East (e.g., Iran and Saudi Arabia). Vietnam does not have as large a rice presence in the Middle Eastern market as it does in Southeast Asia, so the rice price impacts are less pronounced in the country. Conversely, the largest importer of Vietnamese rice, the Philippines, experiences the largest increase in import price among all countries at 10.45 percent. Rice production in the Philippines does increase in response to the loss in rice imports, but this growth is restricted to 2.85 percent. This number is not enough to make up for the loss in rice imports, so rice consumption in the Philippines also falls and the domestic price of rice in the Philippines increases by 2.25 percent. Ghana and China have the second- and third-largest increase in import price at 6.49 and 4.77 percent, respectively.

It is important to note that the GTAP model is a large general equilibrium model that covers a wide variety of commodities and countries. This model provides the benefit of a wider variety of results, including substitution across commodities, though at the cost of missing some nuances within particular markets that may be captured by more specialized partial equilibrium models. For instance, beginning in 2021, Vietnam considerably increased its imports of rice. Most of this increase is imported from Cambodia, processed in Vietnam, and reexported to the global market (Mit et al., 2025; Hoy, 2024). Though the GTAP model does capture an increase in rice exports from Cambodia and a large decrease in Vietnamese imports of 22.57 percent, the model does not account for this explicit interaction between the two countries. As a result, because Vietnam is not consuming the rice imports from Cambodia domestically, the decrease in Vietnamese rice imports may be larger in reality and the additional availability of Cambodian rice would lead to smaller changes for the other countries included in the model. Hertel (1985) compared partial and general equilibrium models by conducting an analysis of the New York State economy using a flexible, partial equilibrium model and a more restrictive, general equilibrium model. The study found that, for that particular application, the partial equilibrium model performed better. However, the general equilibrium model could be improved by using flexible functional forms, as opposed to the more convenient functional forms that come with restrictive maintained hypotheses.¹⁴

It is also important to note that the GTAP model is static and therefore does not take time into account. Therefore, these results are from a new long-run equilibrium following Vietnam's policy, which can take time to reach in reality. For agricultural products, for example, output cannot adjust quickly when planting has already occurred. It is important to keep in mind, therefore, that the imme-

¹⁴ See also Gohin and Moschini (2006), and Van Tongeren et al. (2001) for additional studies comparing partial and general equilibrium models.

mediate price impacts of Vietnam's rice export restriction would likely be larger (assuming the restriction is not phased in). When the international rice price increases quickly, several countries may impose rice export restrictions. These restrictions can quell the rise in domestic rice prices, as occurred during the global food price crisis of 2008, when the global rice price benchmark (Thai 5-percent broken) spiked by more than 190 percent over 5 months, January to May (Bradsher & Martin, 2008; Headey & Fan, 2008).¹⁵ More recently, India imposed rice export restrictions in 2022 and 2023 out of fear of rising food inflation in domestic markets—causing the same benchmark price to rise by about 30 percent over 7 months, between April and November (from figure 2). We can therefore expect that if Vietnam's export restriction causes a large enough increase in the international price, then India and other countries may introduce their own rice export restrictions to counter the threat of rising domestic prices.

To analyze the potential impacts of India imposing its own export restrictions following those of Vietnam, we run an additional “compound” scenario in which Vietnam restricts its exports to 4 million metric tons annually and India responds to international price increases with its own export restrictions. To determine the appropriate shock to introduce to India's rice exports in the compound scenario, we look to India's most recent bans. From August 2022 through June 2023, India's monthly average rice exports were 1.84 million metric tons. Then, in late July 2023, India imposed its ban on exports of non-basmati rice and India's monthly export average fell to 1.23 million metric tons from August 2023 through June 2024 (67.0 percent of the August 2022 through June 2023 average). By assuming that India's export restrictions following Vietnam's export limit will result in the same percent decrease in rice exports as the recent non-basmati ban, we can introduce a 33.0-percent shock to India's rice exports in the compound scenario. The results of this scenario are presented in table 2.

¹⁵ It should be noted that the 2008 food price crisis was significant as it was influenced by various factors. Other factors included many countries imposing export restrictions, such as rising global energy prices and macroeconomic factors such as exchange rates and inflation (Headey & Fan, 2008).

Table 2

Impacts of Vietnam's 4-million metric ton rice export restriction and 33.0 percent reduction in India's exports on global rice markets

Country	Domestic price (percent)	Export price (percent)	Import price (percent)	Domestic consumption (percent)	Domestic production (percent)	Imports (percent)	Exports (percent)
China	0.02	0.02	5.62	0.00	0.14	-19.93	6.17
Cambodia	0.47	0.47	0.53	-0.05	0.76	-0.28*	8.06
Indonesia	0.32	0.20	4.88	-0.05	0.34	-16.72	18.80*
Malaysia	1.91	1.26	4.46	-0.15	3.85	-7.59	16.21
Philippines	2.51	1.49	11.58	-0.33	3.15	-33.35	-10.42*
Thailand	1.47	1.47	1.84	-0.14	5.71	-1.37	12.01
Vietnam	-4.08	14.65	0.40	0.60	-12.12	-23.58	-51.77
India	-1.10	21.48	0.46	0.23	-4.57	-5.76*	-33.00
Pakistan	2.14	2.16	0.65	-0.23	6.71	7.81*	23.61
United States	0.58	0.16	4.02	0.00	3.93	-11.40	13.45
Mexico	0.17	0.03	0.44	-0.01	0.34	-0.99	10.55*
Brazil	0.01	0.01	0.14	0.00	0.16	-0.43	11.75
Iran	15.76	2.11	21.12	-1.62	28.62	-22.30	1.91*
Saudi Arabia	33.06	0.42	35.59	-1.69	110.53*	-5.80	14.91*
Cote d'Ivoire	0.33	0.06	5.77	-0.20	1.13	-3.03	7.07*
Ghana	6.13	1.31	8.47	-0.97	14.78	-9.51	5.97*
Senegal	9.58	2.38	10.77	-1.65	9.76	-6.05	-3.03*

*Starting value is small (less than 100,000 metric tons), so the given percent change corresponds to a small change in quantity.

Source: USDA, Economic Research Service using the Global Trade Analysis Project (GTAP) model.

Price impacts are larger for many countries, but specifically for major rice consuming and import-dependent countries in the Middle East and Africa. This reflects India's large presence in the global rice market and imports destined for these countries. In particular, the double-digit increase in domestic prices for Iran and Saudi Arabia, neither of which had a double-digit price increase under the first scenario. These increases in domestic price lower demand in these countries, which may reduce daily caloric intake for the poorest consumers. Initial or more immediate price changes may be even higher than those captured by the GTAP model in table 2 for reasons noted earlier. This is evidenced by the price changes following India's ban on exports of non-basmati white rice (figure 2) wherein export prices surged immediately following the ban but began to subside as global markets shifted to account for India's export ban and reach a new equilibrium.

The changes for Vietnam are almost identical to the first scenario in which only Vietnam reduces rice exports. This is because Vietnam's 4 million metric ton export limit does not allow Vietnamese exporters to take advantage of the increased availability to export following India's export restrictions. Table 2 shows that other rice exporting countries take full advantage of the drop in exports from India and Vietnam, with double-digit increases in exports for other major exporters such as Thailand, Pakistan, the United States, and Brazil. Thailand, for example, experiences a 5.71-percent

increase in rice supply and a 12.01-percent increase in rice exports following the compound scenario restrictions. This is in addition to an increase in domestic and export prices of 1.47 percent, which makes Thailand's rice producers and exporters major beneficiaries of the compound scenario restrictions. With exports falling 33 percent for India, there is a relative increase in the availability of rice for domestic consumers, which causes the domestic price to fall 1.10 percent and domestic demand to increase 0.23 percent, thus benefitting domestic consumers. More notably, the supply of rice in India (the world's second-largest rice producing country behind China) falls 4.57 percent, which would have a significant negative impact on India's rice farmers. The model does not consider domestic policies that may influence production, such as price supports and production subsidies. The United States is more heavily impacted when there is the additional rice export restriction in India. Notably, exports increase by 13.45 percent in the second scenario where they increased by only 1.11 percent in the first scenario. Similarly, changes in domestic price and domestic production were larger in the second scenario, increasing by 0.58 and 3.93 percent, respectively. Additionally, U.S. imports fall by 11.40 percent as the import price increases by 4.02 percent.

Conclusion

In May 2023, Vietnam approved a policy that aimed to cut its annual rice exports to 4 million metric tons by 2030, a 51.77-percent reduction from Vietnam's exports in 2030 under the baseline scenario developed in this study. Vietnam stated that this rice export restriction would help boost exports of high-quality rice and assist in reducing Vietnamese agriculture's impact on the environment. As the second-largest rice exporter in the world (surpassing Thailand in 2024), Vietnam's export restriction would have a considerable impact on the volume of global rice exports available for importers. According to the USDA's baseline projections, global rice imports will increase from 54.3 million metric tons in marketing year 2023/24 to 65.6 million metric tons in marketing year 2030/31, an increase of 20.8 percent (USDA, 2024). Projected increases in population and income growth in Sub-Saharan Africa, which includes several of the world's most food insecure nations, are largely driving this increase in global imports. Thus, a relative shortage of rice exports in the global market may increase international and domestic rice prices and potentially threaten the welfare of the most import-dependent and food insecure countries in Africa.

Results under our first scenario assess the implication of Vietnam imposing a rice export quota of 4 million metric tons on global rice markets. Results show that restricting Vietnam's exports to 4 million metric tons in 2030 is equivalent to a 51.77 percent drop in exports relative to what exports would be under a baseline scenario in 2030. This decrease leads to higher export prices for Vietnamese rice (an increase of 13.23 percent), which leads to lower imports for countries that typically rely on Vietnam for rice. For instance, the Philippines (Vietnam's largest export market for rice) decreases imports by 30.04 percent as the import price increases by more than 10 percent. China, Ghana, and Indonesia (the second-, third-, and sixth-largest importers of Vietnamese rice from 2019 to 2024) also have large decreases in imports following Vietnam's export restriction. The impacts of the export limit are relatively small for many of the other major rice importing countries (e.g., major rice importers in Sub-Saharan Africa, due to Vietnam's relatively small presence in these markets). Many of the largest rice importers in Sub-Saharan Africa rely primarily on India to supply their rice imports, which mitigates the impacts of Vietnam's export limit in these countries. Additionally, because the United States and Vietnam share few common major rice export markets (see figures 8 and 9), the impacts of Vietnam's export limit on U.S. producers and exporters are relatively small.

In the second scenario, results reflect the impact of a potential follow-on of export restrictions by India, together with those of Vietnam as modeled in the first scenario. Because India is one of the largest exporters of rice, the scenario is useful for understanding impacts when countries impose restrictive export policies to shield domestic consumers from price increases. This occurred in 2008 when India, Vietnam, and 12 other countries introduced export restrictions to prevent domestic rice prices from spiking during the global food price crisis, when global rice prices rose by about 190 percent (Headey & Fan, 2008; Bradsher & Martin, 2008). More recently, rice export restrictions imposed by India in 2022 and 2023 during the food price inflation period following the Coronavirus (COVID-19) economic lockdowns led to considerable impacts on the global market.

Results under our second scenario show a more pronounced impact due to India's large and widespread presence in the international rice market. For instance, the price increases and subsequent drop in imports and consumption in Sub-Saharan Africa are significantly larger than in the first scenario when only Vietnam imposed export restrictions. Additionally, rice imports into Iran and Saudi Arabia fall about 22.30 and 5.80 percent, respectively, as opposed to minimal impacts under the first scenario. This is because India is the primary exporter of rice to these countries. Conversely, for the Philippines, Vietnam's export restriction has a much larger impact than India's because Vietnam is its primary source for imports. Specifically, rice imports into the Philippines decrease by 30.04 percent following Vietnam's export limit alone but decrease further by only 3.31 percent (33.35–30.04) under the second scenario, with both Vietnam and India imposing export restrictions. For the United States, the addition of export restrictions in India had a considerable impact on the increases to U.S. supply and exports, which increased by 3.93 and 13.45 percent, respectively, compared to 0.35 and 1.11 percent in the first scenario. This is likely because of a more direct competition between the United States and India than with Vietnam in global rice markets. It is important to note that, due to data limitations, the model does not differentiate rice based on variety. Therefore, all rice varieties are considered one commodity in the model and, as such, some of the substitution (importers substituting U.S. rice for Indian and Vietnamese rice, for instance) may be overstated. If data become available in the future, a useful extension of this analysis would be a disaggregation of rice by variety. Overall, our model results suggest that Vietnam's 4 million metric ton export quota for rice will not have a significant impact on U.S. rice production or exports. However, if other countries follow suit by introducing their own export restrictions to counter any rising global prices, then U.S. producers and exporters may be able to gain more market share and have a larger increase in exports.

We further point out that this study utilizes the static version of the Global Trade Analysis Project (GTAP) computable general equilibrium model. A limitation of the model is that as a static model it cannot capture any immediate or dynamic price effects of a policy change but rather represents a new equilibrium at a future point in time when all economic factors have fully adjusted to the shock. Our results, therefore, capture only these final adjustments to a new equilibrium. Effects on prices and quantities traded may be much higher in the initial or more immediate phase following a policy shock such as an export restriction. Additionally, India's export ban in 2023 was a short-term solution to world price volatility and was lifted when prices settled. Consequently, the additional export restriction in India analyzed in the second scenario may also be a short-term solution to price volatility, and the results of the second scenario may best be interpreted as a short-term fluctuation in the global market rather than a new long-run equilibrium. Nevertheless, the results can help to highlight the potential impacts of a trade policy shock. As in our example, the analysis helps to determine the potential negative welfare effects of Vietnam's (and India's hypothetical) export restriction on import-dependent countries, including identifying which countries may be hardest hit by the policy shock.

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Appendix: Computable General Equilibrium GTAP Model

Simulating the 2030 Baseline Scenario

Table A.1 presents the percentage changes (calculated from Centre for Prospective Studies and International Information (CEPII) data for population, Gross Domestic Product (GDP), labor, capital, and total factor productivity) that were used to bring the Global Trade Analysis Project (GTAP) model baseline year from 2025 to 2030.

Table A.1

Projected changes in macroeconomic variables from 2025 to 2030 (percent)

Country/Region	Gross Domestic Product	Capital	Labor	Population	Total factor productivity
Albania	8.49	14.13	-3.87	-1.88	7.27
Algeria	19.82	21.34	4.80	6.27	9.65
Argentina	9.31	10.07	4.10	3.95	3.35
Armenia	11.78	13.17	0.05	-0.34	7.79
Australia	10.34	12.39	4.74	4.83	3.17
Austria	1.45	6.13	-2.02	0.78	1.12
Azerbaijan	14.21	21.31	1.37	2.33	6.77
Bahrain	15.44	21.90	6.77	7.95	4.11
Bangladesh	31.27	32.64	5.54	3.83	16.27
Belarus	2.11	5.85	-3.37	-1.29	2.92
Belgium	4.70	7.12	-0.26	1.24	2.80
Benin	30.08	26.82	16.77	13.39	9.06
Bolivia	29.34	26.29	7.65	6.19	14.76
Botswana	19.34	21.31	13.05	8.04	3.43
Brazil	5.11	7.51	1.45	2.21	1.89
Brunei Darussalam	1.91	0.20	1.58	3.25	0.85
Bulgaria	8.05	13.25	-4.48	-4.03	7.59
Burkina Faso	35.65	33.56	16.40	14.21	12.16
Cambodia	39.96	40.01	7.92	5.48	20.18
Cameroon	31.57	27.57	14.71	12.43	11.20
Canada	9.02	9.85	3.09	3.83	3.82
Central African Republic	-11.45	-7.05	16.37	11.31	-18.10
Chad	27.21	29.75	18.10	14.40	5.13
Chile	10.29	13.90	1.72	1.13	4.87
China	32.18	37.85	-2.85	0.44	22.67
Colombia	14.80	16.70	4.25	2.71	6.50
Comoros	23.86	19.09	13.97	10.17	7.83
Congo, Democratic Republic	36.30	28.06	17.01	15.28	13.73

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Country/Region	Gross Domestic Product	Capital	Labor	Population	Total factor productivity
Congo, Republic of	27.86	21.33	15.38	12.59	9.37
Costa Rica	14.92	18.32	2.55	3.13	7.41
Cote d'Ivoire	53.82	42.48	14.93	12.80	25.93
Croatia	1.32	2.85	-4.65	-2.92	3.93
Cyprus	-2.02	3.99	1.91	2.43	-4.40
Czech Republic	8.78	8.19	-0.52	-0.11	6.70
Denmark	5.69	8.43	-0.07	1.72	3.23
Dominican Republic	20.86	24.76	5.97	3.74	8.64
Ecuador	16.44	17.58	7.17	5.75	5.75
Egypt, Arab Republic of	24.76	22.35	10.60	8.15	9.62
El Salvador	14.60	14.38	4.33	2.04	6.93
Equatorial Guinea	3.14	6.93	16.12	14.44	-8.92
Estonia	15.23	14.69	-1.82	-2.04	12.19
Ethiopia	36.38	44.90	15.32	11.71	10.79
Finland	2.23	4.99	0.60	0.20	0.39
France	5.31	6.90	0.57	0.98	2.85
Gabon	24.27	19.38	10.50	10.32	10.21
Georgia	27.14	25.66	-2.13	-1.93	20.69
Germany	4.47	7.67	-3.24	-0.45	4.60
Ghana	32.73	32.70	10.97	9.95	13.45
Greece	-12.01	-4.15	-4.72	-2.34	-7.77
Guatemala	24.78	24.51	11.22	8.33	8.69
Guinea	40.01	32.61	17.74	13.44	15.14
Haiti	17.77	11.00	9.43	5.33	7.65
Honduras	14.31	18.46	9.56	7.08	2.09
Hong Kong, China	8.43	11.34	-2.11	3.39	6.60
Hungary	5.49	10.03	-1.71	-1.85	3.82
India	46.32	48.46	4.77	4.06	26.06
Indonesia	25.66	26.50	5.35	4.22	13.00
Iran, Islamic Republic of	7.52	17.97	0.15	4.38	2.35
Iraq	17.58	23.29	15.01	11.08	0.31
Ireland	11.72	20.31	3.55	2.72	3.17
Israel	17.73	18.46	9.04	7.09	5.36
Italy	-4.66	0.86	-3.69	-1.41	-2.34
Jamaica	0.81	2.81	1.67	1.08	-1.11
Japan	5.65	5.48	-2.72	-2.60	6.03
Jordan	6.99	13.32	5.50	3.05	-0.63

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Country/Region	Gross Domestic Product	Capital	Labor	Population	Total factor productivity
Kazakhstan	25.33	25.06	3.47	4.30	14.57
Kenya	32.58	29.31	16.90	10.78	10.35
Korea, Republic of	10.44	14.93	-1.77	-0.36	7.38
Kuwait	-0.11	9.41	4.46	5.07	-5.70
Kyrgyz Republic	26.96	21.10	5.66	6.22	15.71
Lao, People's Democratic Republic of	43.31	42.74	8.44	5.81	22.06
Latvia	12.87	9.14	-6.61	-4.36	15.40
Lebanon	-5.69	2.60	-3.98	-3.16	-3.62
Lithuania	9.40	10.86	-8.88	-4.11	13.23
Luxembourg	9.31	15.24	2.25	4.42	3.17
Madagascar	20.37	18.10	15.46	13.05	3.89
Malawi	34.81	32.39	18.06	13.69	10.69
Malaysia	21.34	22.02	5.78	5.08	10.06
Mali	34.15	31.92	19.18	15.12	9.52
Malta	17.70	21.88	-0.43	0.38	11.28
Mauritius	16.00	18.58	-0.19	-0.20	10.43
Mexico	14.37	15.55	5.75	4.13	5.40
Mongolia	40.85	43.79	2.88	5.76	24.06
Morocco	22.05	23.23	4.90	4.81	10.95
Mozambique	31.14	40.57	16.66	14.45	6.55
Namibia	21.56	20.14	13.40	8.53	5.42
Nepal	31.40	38.39	8.38	5.14	13.01
Netherlands	3.51	7.03	-1.11	0.75	2.24
New Zealand	13.43	13.99	3.39	3.33	6.62
Nicaragua	30.56	29.68	8.62	5.48	14.18
Niger	23.48	21.89	21.07	19.64	2.15
Nigeria	33.44	34.26	13.24	12.70	12.12
Norway	8.61	10.26	2.96	3.98	3.36
Oman	-0.32	8.88	3.65	6.51	-5.22
Pakistan	25.49	26.17	11.81	8.56	8.44
Panama	25.98	32.26	7.40	6.30	10.24
Paraguay	24.24	25.44	7.25	5.19	10.59
Peru	24.76	24.55	6.14	4.38	12.12
Philippines	34.48	31.11	8.64	5.88	17.07
Poland	12.46	16.55	-2.72	-1.52	9.56
Portugal	2.97	6.26	-4.35	-1.47	4.36

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Country/Region	Gross Domestic Product	Capital	Labor	Population	Total factor productivity
Puerto Rico	6.35	3.06	0.99	-0.04	4.80
Qatar	13.67	31.71	5.12	6.57	1.21
Romania	9.87	13.53	-5.54	-2.49	10.12
Russian Federation	9.21	5.01	-2.82	-1.23	9.93
Rwanda	39.67	37.03	14.73	11.37	15.78
Saudi Arabia	9.56	15.52	3.48	5.57	2.50
Senegal	40.95	35.58	16.76	13.06	15.55
Serbia	4.22	1.95	-3.78	-3.00	6.53
Singapore	11.37	17.18	0.50	3.02	5.86
Slovak Republic	11.19	12.94	-2.35	-0.85	9.04
Slovenia	3.62	6.89	-4.37	-0.81	4.86
South Africa	7.70	9.05	5.57	5.02	1.21
Spain	2.23	6.75	-3.35	-0.74	2.70
Sri Lanka	26.27	29.45	1.71	1.12	15.53
Sudan	30.91	34.89	15.04	11.95	8.55
Sweden	7.86	8.91	2.54	2.36	3.33
Switzerland	5.71	7.54	0.38	2.78	3.17
Tajikistan	41.32	-0.99	11.26	9.41	31.64
Tanzania	44.01	39.47	16.68	14.84	17.33
Thailand	20.41	19.59	-1.49	0.02	15.60
Togo	30.43	19.25	14.08	11.96	13.17
Trinidad and Tobago	-1.51	4.55	-0.37	0.05	-2.51
Tunisia	12.17	13.61	1.63	3.31	6.86
Turkey	20.20	23.60	2.36	2.83	11.04
Uganda	27.98	28.83	20.17	13.66	4.57
Ukraine	-6.34	-9.69	-4.85	-3.44	0.22
United Arab Emirates	15.68	21.98	0.87	3.27	8.50
United Kingdom	9.12	9.26	1.50	1.75	5.19
United States	8.77	10.54	1.70	2.72	4.37
Uruguay	16.77	17.19	2.32	1.23	9.63
Uzbekistan	41.98	40.35	6.07	5.06	23.39
Venezuela	0.91	-2.61	9.39	6.81	-4.41
Vietnam	34.85	39.57	2.70	3.02	20.09
West Bank and Gaza	26.40	22.07	16.19	10.90	7.31
Zambia	32.00	37.05	18.37	14.76	6.83
Zimbabwe	42.65	17.66	16.64	9.22	22.09
Rest of world	26.18	24.52	10.23	8.80	6.49

Source: USDA, Economic Research Service using data from the Centre for Prospective Studies and International Information (CEPII) EconMap database.

Simulating the Implementation of Vietnam's Rice Export Restriction

Two scenarios were considered when determining the impacts of Vietnam's reduction in rice exports to 4 million metric tons.

Scenario 1. We introduced a shock to Vietnam's rice exports that reduced its annual export volume to 4 million metric tons. To accomplish this, we first swapped the "txs" exogenous variable for Vietnam's rice exports (which represents the ad-valorem export tax) for the "qxs" endogenous variable for Vietnam's rice exports (which represents export volume). This was accomplished by inserting the following code into GTAP's closure tab.

```
swap txs("Rice","vnm",REG) = qxs("Rice","vnm",REG);
```

Only the "txs" and "qxs" variables for Vietnam's rice exports were swapped. This left all other exports endogenous in the model. By swapping these variables, we could set Vietnam's export volume at 4 million metric tons by reducing the new "qxs" variable by 51.77 percent, which can only be shocked if exogenous. Note that the 51.77 percent value was calculated by taking the ratio of difference between Vietnam's export volume from the 2030 baseline scenario (8,293,600 metric tons) and 4 million metric tons and dividing this difference (4,293,600 metric tons) by Vietnam's export volume from the 2030 baseline scenario. This was accomplished by inserting the following code into GTAP's shocks tab.

```
shock qxs("Rice","vnm",REG) = uniform -51.77;
```

Scenario 2. The second scenario included shocks to both Vietnam and India's exports. Consequently, "txs" and "qxs" for both countries were swapped. This was accomplished by inserting the following code into GTAP's closure tab.

```
swap txs("Rice","vnm",REG) = qxs("Rice","vnm",REG);
```

```
swap txs("Rice","ind",REG) = qxs("Rice","ind",REG);
```

Then, we applied the shocks to both Vietnam and India's exports volumes with the following code in the shocks tab.

```
shock qxs("Rice","vnm",REG) = uniform -51.77;
```

```
shock qxs("Rice","ind",REG) = uniform -33.0;
```

Note that the 33.0-percent reduction for India's exports was calculated based on realized export volume changes that occurred in India following its export ban on numerous rice varieties. Specifically, according to data from July 2024, India's average monthly exports (from August 2023 through June 2024) fell 33.0 percent from the August 2022 to June 2023 average (Trade Data Monitor, 2026).